

**The work of the s.s. Pieter Faure in Natal waters,
with special reference to the Crustacea and Mollusca; with
descriptions of new species of Mollusca from Natal***

by

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Although in a different line of research from that in which Dr R. F. Lawrence has become one of the foremost authorities, this paper is offered as a token of esteem and of a forty year friendship.

THE WORK OF THE *PIETER FAURE* IN NATAL

In 1895 the Cape Government inaugurated a Marine Biological Survey and appointed Dr J. D. F. Gilchrist as Marine Biologist. Dr Gilchrist promptly urged the necessity of a vessel for this purpose, and the steam trawler *Pieter Faure*, 176 tons, was built in Glasgow in 1897 (8. Photograph: frontispiece to vol 4).** She began work in August 1897, and by 1900 had carried out a detailed survey of Cape waters from St. Helena Bay to the East London area, in the course of which several areas suitable for commercial trawling were discovered.

These successful results were noted by the Natal Government, and application was made to the Cape Government for assistance and advice for similar investigations along the Natal coast. The request was readily agreed to, and the *Pieter Faure* spent 3½ months (13 December, 1900, to 5 April, 1901) surveying the coast from Durban to Cape Vidal (Zululand), together with several stations along the Natal South coast on her way back to Cape waters.

From a commercial point of view the results of the Natal survey were not encouraging. "The coast of Natal is not a promising one for trawling operations". ". . . no great area of water, less than 100 fathoms in depth, is to be found on the coast, and most of the soundings showed rock, or ground unsuitable for trawling." "A fairly extensive area of mud was found near the mouth of the Tugela River, but there was a remarkable scarcity of fish . . ." [9. 1901, pp. 1, 2.].

* This paper is part of my research work on South African marine Mollusca carried out with the aid of a research grant from the South African Council for Scientific and Industrial Research, to whom acknowledgement and thanks are herewith made.

**Named after Sir Pieter Hendrik Faure, then Secretary for Agriculture. Many years later known as the "Robben Island Mailship". She was finally scuttled in 1947 after fifty years service.

"Many new and interesting forms of marine life were procured, . . . having indirectly an important bearing on fishing questions" [9. 1901, p. 2]. This was no exaggeration, because although the main purpose of the survey was the discovery of trawling areas, the scientific aspect was not neglected.

From among the contents of the dredges and trawls when emptied on deck, fishes took precedence for the preserving jars. But a perusal of the record books [7] shows that the crew must have worked hard, and a very impressive quantity of Invertebrates was brought back for investigation. With a larger vessel, with more facilities and equipment, and a larger staff, an even greater amount of "small stuff" would have been preserved.

The ship was at sea on 52 days, during which 55 hauls were made with the large dredge, 24 with the shrimp trawl, and 8 with the large (otter) trawl.

Over 2,000 serial numbers (P.F. 10591—12620) were used in bottling the specimens. Many of these serial numbers refer to bottles containing several species, or a mixed lot of crustacea, sponges, alcyonarians etc. No detailed sorting was done on board, though the catch was usually sorted into general classes, e.g.: "Sponges 3 kinds", "Amphipods and Isopods", "Alcyonarians treated with C.Hydrate", "Coral like large soldier's button", "Cup-corals 400 obtained, 200 preserved."

From the bottom-deposits which came up in the dredge most of the larger specimens were picked out, but not always all of them. Some of the deposits were washed. But when there was a large quantity, sometimes a quarter or half a dredge-full, the whole was not preserved, only one or two bottles-full. Thus many small crustacea, molluscs etc. went back into the sea.

Formalin (3%—5%) was used for preservation, and unfortunately the bulk of the collection was allowed to remain as preserved for several years. In 1910, however, the collection was transferred to the South African Museum, and most of the Invertebrates removed to alcohol. Nevertheless many specimens were found to be in unexpectedly good condition; especially in the case of bottom-samples from which the liquid had evaporated.

Some details of the area surveyed are obtainable from the Record books [7]*. A coastal strip approximately 150 miles long and 15 miles wide was covered; but off the Tugela River trawling and sounding extended out from shore to 24 miles. The depths ranged from 6 to 100 fathoms. The bottom-deposits were mostly shelly sand, broken shells, stones, and rock; patches of mud and fine sand were found only in the neighbourhood of the big estuaries: Tugela and Amatikulu, St. Lucia, and Durban.

On the return cruise after completing her main work in Natal, the *Pieter Faure* made one haul 11 miles out from Durban in 185-200 fathoms with dredge and shrimp trawl, and another at 24 miles in 440 fathoms with shrimp trawl. Off Port Shepstone two hauls were made: one with dredge at 11 miles off shore in 250 fathoms,

* A detailed report with chart of soundings was supplied to the Natal Government. The chart was not reproduced in the Reports of the Marine Biologist (Cape) [9].

the other at 12 miles where the trawl did not touch bottom with 500 fathoms of wire out [7].

The Invertebrates obtained from these deep-sea hauls, especially the one off Durban in 440 fathoms, have proved extraordinarily interesting from the scientific point of view, and indicate that further investigations would be very productive. Except off Cape Point the *Pieter Faure* sampled the continental slope below 250 fathoms only at this one locality off the Natal coast, and at two localities in the East London area, where at 300-400 fathoms an equally interesting deep-sea fauna was discovered.

A complete list of the Fishes and Invertebrates, which were either undescribed species or new records for the Natal coast, could be compiled from the works quoted in the bibliography [1-5, 8, 10, 11]. For the present purpose an approximate, and conservative, estimate of the respective numbers will suffice.

	<i>Species</i>
Fishes. 12 new species, one new record.	13
Crustacea (excluding pelagic Copepoda). 8 new genera, 45 new species and varieties, 44 new records.	89
Mollusca (excluding Pteropods). One new genus, 63 new species, 42 new records	105
Sponges. Three new genera, 22 new species and varieties, 5 new records	27
Echinoderms. Four new species, 13 new records	17
Corals. Five new records	5

The numbers of Mollusca include the species mentioned in my paper in the *Annals of the Natal Museum* [4], but not those in the present paper, nor a few others which have not yet been satisfactorily identified and are better reserved for future comparison with closely allied species.

These results are not surprising coming from an area whose fauna had not previously been investigated. Soundings had probably been taken by such ships as H.M.SS. *Sulphur*, *Samarang*, *Rattlesnake*, *Castor* in the first half of the XIXth century. The little dredging they did was on the Agulhas Bank. H.M.S. *Challenger* and the *Valdivia* (German Deep-sea Expedition) also did not touch Natal waters.

The *Pieter Faure* was successful in demonstrating the presence of Stockfish, Natal Kingklip, Soles, and various other fishes, but whether they could be fished in payable quantities remained doubtful. She confined her operations to depths of less than 100 fathoms except for the four deep water hauls. Thus in later years it fell to the lot of the *Pickle* to extend investigations below 100 fathoms.

Among the Invertebrates one of the surprising finds in this area was the Natal Crawfish (*Palinurus gilchristi* var. *natalensis*) which occurred in great abundance. This Natal crawfish differs only in slight details from the typical Gilchrist's Crawfish from False Bay and the Agulhas Bank, but is quite distinct from the Cape Crawfish (*Jasus lalandii*). Though smaller than the latter, ". . . the flavour and texture of the meat is much superior" [6. Rep. 9, p. 20].

The hauls at Durban 185-200 fathoms and Port Shepstone 250 fathoms were not particularly rich, but the Durban 440 fathoms haul deserves special mention together with a list of the species taken.

Ten Decapod Crustacea, including 2 new species; one new genus and species of Isopod; 10 species of Sympoda (Cumacea) of which one represented a new genus, and only one was previously known.

The Mollusca were not so numerous, but 9 new species and one already known were obtained. In addition a specimen of a *Dentalium*, originally described from 900 fathoms off Cape Point, has been found during a recent examination of the 440 fathoms bottom-sample.

In the following list later changes in nomenclature are disregarded, because whatever name was given to it at the time or subsequently, the species was an addition to the Natal faunal list. An asterisk indicates a species, and a dagger a genus, new to science at the time.

Crustacea	References and Remarks
Decapoda—	
* <i>Platymaia turbynei</i> Stebbing	Stebbing (1902). Named after the skipper of the <i>Pieter Faure</i> .
<i>Uroptychus nitidus</i> M.Edw.	Stebbing (1902).
<i>Calocaris alcocki</i> McArdle	Stebbing (1915).
<i>Nephropsis atlantica</i> Norman	Stebbing (1902).
<i>Polycheles sculptus</i> S.I. Smith	Stebbing (1902).
<i>Phye pacificus</i> Rathbun	Stebbing (1914). Recently regarded as a new species of <i>Pasiphaea</i> .
<i>Acanthephyra brachytelsonis</i> Bate	Stebbing (1915).
<i>Nematocarcinus parvidentatus</i> Bate	Stebbing (1915).
<i>Heterocarpus alphonsi</i> Bate	Stebbing (1914).
* <i>Sclerocrangon bellmarleyi</i> Stebbing	Stebbing (1914).
Isopoda—	
†* <i>Bathynatalia gilchristi</i> Barnard	Barnard (1958).
Sympoda (Cumacea)—	
<i>Ceratocuma horridus</i> Calman	Stebbing (1912).
* <i>Bathycuma natalensis</i> Stebbing	
* <i>Adiastylis acanthodes</i> Stebbing	
†* <i>Makrokylindrus fragilis</i> Stebbing	
* <i>Leptostylis macruroides</i> Stebbing	
* <i>Leucon kalluropus</i> Stebbing	
* <i>Schizotrema calmani</i> Stebbing	
* <i>Procampylaspis tridentatus</i> Stebbing	
* <i>Campylaspis ovalis</i> Stebbing	
* <i>Campylaspis paeneglaber</i> Stebbing	

Mollusca**Gastropoda—**

- **Pleurotoma lobata* Sowerby Sowerby (1903), Barnard (1958).
 **Drillia bruchia* Barnard Barnard (1958).
 **Mitra (Dibaphus) bathybius* Barnard Barnard (1959).
Nassa babylonica Watson Tomlin (1928), Barnard (1959).
 **Trophon incertus* Barnard Barnard (1959).
 **Trophon pistillum* Barnard Barnard (1959).
Trophon sp. juv. Barnard (1959).
 **Solariella persculpta* Sowerby Sowerby (1903), Barnard (1963).

Scaphopoda—

- **Dentalium subterlineatum* Tomlin Tomlin (1931), Barnard (1963).

Lamellibranchia—

- **Nuculana compta* Sowerby Sowerby (1904).
 **Poromya curta* Sowerby Sowerby (1904), *Ignorata* Barnard
 **Cuspidaria forticostata* Sowerby Sowerby (1904).

Echinodermata

- Phormosoma* sp. Bell (1904). Later identified as
Echinosoma petersii Clark, 1923.

The Invertebrate fauna of the coastal waters of Natal has long been known to be Indo-Pacific in character; and further additions of species well-known in that region, and especially the East coast of Africa, are to be expected as the Survey progresses. But in the deeper waters, species appear which, if not identical, are very closely allied to species living in deep water in the Indian Ocean on the one hand, and in the Atlantic Ocean on the other hand.

The Crustacean *Platymaia turbynei* has close affinity to Indo-Pacific species, but *Uroptychus nitidus* from Natal appears to be specifically identical with specimens from the North Atlantic. *Nephropsis atlantica* occurs in the Atlantic, Arabian Sea, and Natal.

Similar examples among the Mollusca are: *Pleurotoma gilchristi* from Natal is so closely similar to several other so-called species from the Indo-Pacific that eventually it may become a synonym; *Nassa desmoulioides* described from Natal (40-100 fathoms) has recently been discovered in the tropical eastern Atlantic; *Eudolium crosseanum* from the North Atlantic and West Indies occurs in deep water off East London (also in Natal, but was not taken in the 440 fathoms haul off Durban).

Specimens of an Echinoid from Natal and Cape Point seem indistinguishable from those of *Echinosoma petersii* from the West Indies.

From these few examples there is obviously much work to be done along the

Natal coast, especially on the continental slope, if the difficulties of trawling and dredging on a rough bottom and in a strong current can be overcome.

The *Pieter Faure* ceased operations in 1907 owing to financial stresses, and no further surveying was done until the Union Government took over from the Admiralty the s.s. *Pickle* in 1920. Henceforth the marine survey was carried out along the whole South African coast, more or less equal periods being devoted to the Natal and to the Cape areas [6].

In 1931 the *Pickle* was replaced by the *Africana*. This vessel promptly distinguished herself by hauling up in the Natal area on 21 July, 1931, the first *Pleurotomaria* to be recorded from South African waters [6. Rep. 10, illustrated].

She repeated and extended the operations of the *Pieter Faure* and *Pickle*. During the war years she was requisitioned (1939-1947) for coastal defence work; after which she continued her work until decommissioned in 1949. Since 1950 the survey has been carried on by *Africana II* [6. Rep. 22].

Since the discovery of *Pleurotomaria* neither vessel has procured any further spectacular catches. I have seen only a few of the Crustacea and Mollusca (submitted through the Zoological Department, University of Cape Town), but when the Invertebrates have been fully studied there will certainly be many additions to the Natal fauna-list.

In recent years, however, commercial trawlers seem to have found suitable trawling grounds in the deeper waters beyond the area worked by the *Pieter Faure*, and have brought to light several large and interesting molluscs, e.g. *Xenophora pallidula* and *Ranella olearium* (formerly known as *Gyrina gigantea*).

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Note. The dates on the Title-pages of the volumes are sometimes later than the actual dates of publication of the papers comprising the respective volumes; the date of publication is on the last page of each paper. Vol. 5 constitutes vol. 17 of the *Trans. Philos. Soc.S.Afr.* Part 1 (Bergh, Opisthobranchiata) was published in 1907 (not 1908).
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DESCRIPTION OF NEW MOLLUSCS

TURRITIDAE

***Mangilia serrula* n.sp.**

Aperture subequal to spire (fig. 1a). Protoconch (fig. 1b) 3 ($3\frac{1}{2}$) whorls, alt. 0.6, diam. 0.75 mm., 1st whorl with faint protractively oblique axial pliculae, 2nd axially plicate and with 4-5 spiral lirae, forming tiny granules, 3rd with 5 spiral lirae, increasing to 10-12, the axial plicae gradually becoming farther apart and less granu-lose, no distinct junction with 1st postnatal whorl. Postnatal whorls 4, profile convex with well marked shoulder in middle of whorl. Sinuous protractive axial ribs on 1st-3rd whorls 10, on 4th 8, crossing sulcus, petering out on base; crossed by fine spiral lirae *c.* 12 on 1st whorl, increasing to *c.* 20 on 4th, *c.* 30-35 additional

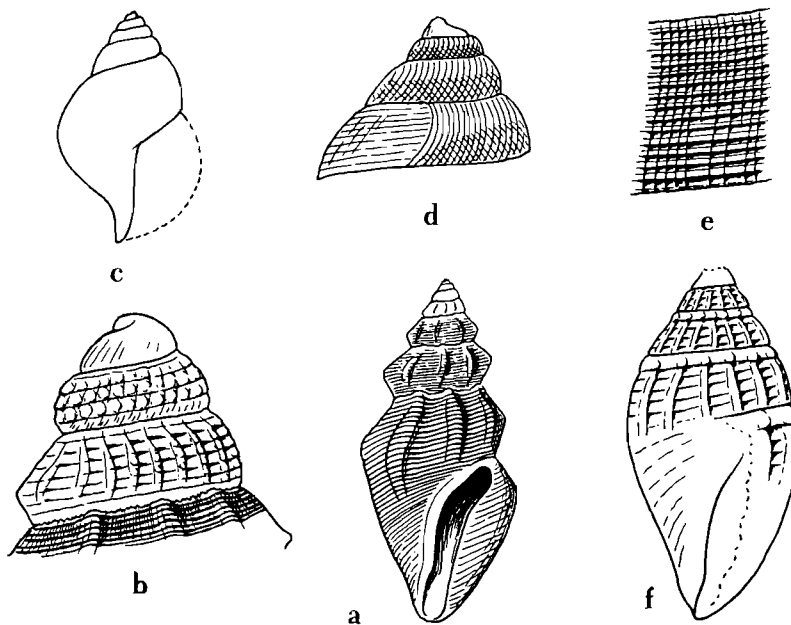


Fig. 1: *Mangilia serrula* n.sp. a, b, shell, with protoconch further enlarged. *Daphnella phyxelis* n.sp. c. shell for shape only. d. protoconch. e. sculpture of later part of 2nd whorl. *Columbella dibolos* n.sp. f.

lirae on base. Sulcus scarcely concave. Lip sinus deep. Growth-lines fine and close, subordinate to the spiral lirae but forming with them a very fine micro-can-cellation. Sutures undulate, more or less finely serrulate. 6.75 x 3mm. White.

Off Illovo and Umkomaas (Natal) 30-40 fathoms, 7 (S.Afr.Mus., No. A8728, P.F.coll.).

Remarks.—Finely spirally lirate like *Drillia spiralis* Brnd., 1958, but more angularly shouldered and with a different protoconch.

M.densegranosa Thiele, 1925 (p. 225, pl. 39 (27), fig. 12) from off the Congo River mouth appears to have a similar granulose protoconch.

***Daphnella phyxelis* n.sp.**

A very fragile and broken shell (fig. 1c) from a bottom-sample, consisting of protoconch and 2 postnatal whorls complete, and fragments of 2 or possibly 3 more whorls.

Protoconch (fig. 1d) 3 whorls, with close-set axial protractive pliculae, and on the lower half of whorl retractive pliculae forming a reticulate micro-sculpture. Postnatal whorls spirally lirate, weak at beginning but becoming stronger, lower ones tending to be slightly wider than upper ones, 12-13 on later part of 1st whorl 16-17 at end of 2nd whorl (fig. 1e). The fragment of the largest whorl has c. 30 lirae from suture to periphery and at least 15-20 on the lower part; usually a fine intermediary (included in the above count) between each pair of wider lirae.

Growth-lines fine, on 2nd whorl forming fine pliculae and producing a micro-cancellate sculpture, but subordinate to the spiral lirae; on the 1st whorl forming an axially striate appearance; perpendicular to the suture above, almost straight, and scarcely protractive. No trace of a sinus.

Protoconch plus 2 whorls 4.5 x 3 mm.; the fragment of last whorl 6 mm. alt.; the whole shell when complete may have been about 12 mm. long.

Off Cape Natal (Durban) 440 fathoms, one (S.Afr.Mus., No. A29635, P.F.coll.).

Remarks.—The absence of a sinus does not exclude this species from the Turritidae. The shape is not very different from that of *D.buccinulum* M. & S., 1903, *Clathurella phyxanor* Watson, 1886, or some species of *Gymnobela*.

Like the deepwater *phyxanor*, this species also shuns the haunts of man.

***Mitromorpha veneris* n.sp.**

1958. Barnard, p. 160 (*Daphnella sulcata* part: Cape Vidal specimen)

Protoconch 2 whorls, alt. 1.5, diam. 1.3 mm., smooth. Postnatal whorls 3½ (last whorl broken). No axial ribs on any of the whorls. Spiral lirae 6 on 1st whorl, becoming 7 on later part, 7 on 2nd, becoming 8 later, 8 on 3rd, becoming 9 later; lirae flattened, slightly wider than grooves. Fine close-set growth-lines in the grooves. 11.5 x 3.75 mm.

Off Cape Vidal (Zululand) 80-100 fathoms, one broken (S.Afr.Mus., No. A8750, P.F.coll.).

Remarks.—Profile of whorls nearly straight as in *apollinis* (not convex with well impressed sutures as in *Daphnella sulcata*). Differs from *apollinis* Thiele, 1925, by larger protoconch (larger even than that of *D.sulcata* which is alt. 1, diam. 0.8 mm.), and the total absence of axial ribs.

South African species of *Mitromorpha*

1. With spiral lirae only—
 - (a) 4-7 lirae on last whorl. Protoconch alt. 0.75, diam. 0.6 mm. *volva* (incl. *hewitti*)
 - (b) 8-9 lirae on last whorl. Protoconch 1.5 x 1.3 mm. *veneris*
2. With axial ribs (at least on early whorls) in addition to spiral lirae—
 - (a) Ribs on early whorls only *apollinis* (incl. *jovis*)
 - (b) Ribs on all whorls. *neptuni*

PYRENIDAE

***Columbella dibolos* n.sp.**

Spindle-shaped (fig. 1f). Protoconch broken. Postnatal whorls 3. Axial ribs c. 13 on last whorl, c. 15 on 2nd and 3rd, tops of the ribs forming granules separated by a spiral groove; spiral lirae 2 on 1st whorl, 3 on 2nd, 4 on 3rd, with ? 12 additional lirae on base. 3.5 x 1.6 mm.

Off Umhloti (Natal) 40 fathoms, 3 dead (S.Afr.Mus., No. A29636, P.F. coll.).

Remarks.—Not so broad as *vitula* Brnrd., 1959, but resembling it in having a distinct "cingulum" below the suture; the ribs and lirae, however, are fewer.

TURBINIDAE

***Calcar rhysopoma* n.sp.**

Shell thick-walled (fig 2a). Protoconch nucleus plus 4 whorls. Profile convex. Spiral lirae narrower than the grooves, rather sharp, 1-2 on 1st whorl, increasing to 3-4 on 2nd, 5-6 on 3rd and 6-7 on 4th whorl; on base 8 followed by 2 broader granulose lirae entering the umbilicus. Extremely fine and close growth-lines in the grooves (not shown in figure). Aperture subcircular, peristome thick, columella concave. 4 x 4 mm. Pale buff, with fuscous spots on the lirae forming more or less continuous radiating axial flames, the peripheral (6th or 7th) lira with slightly larger spots. Two dead shells in the Umkomaas lot are pale pink with darker pink spots.

Operculum thick, nucleus nodular, surrounded by a narrow deep spiral groove, and a broad raised border with close-set radiating pliculae.

Jaws present. Radula (fig. 2b) with c. 25 rows, central plate triangularly expanded with overturned cusp, 5 lateral plates with overturned cutting-edges, 1st marginal plate oval-oblong, with very small apical cusp, 2nd marginal strong, cusp

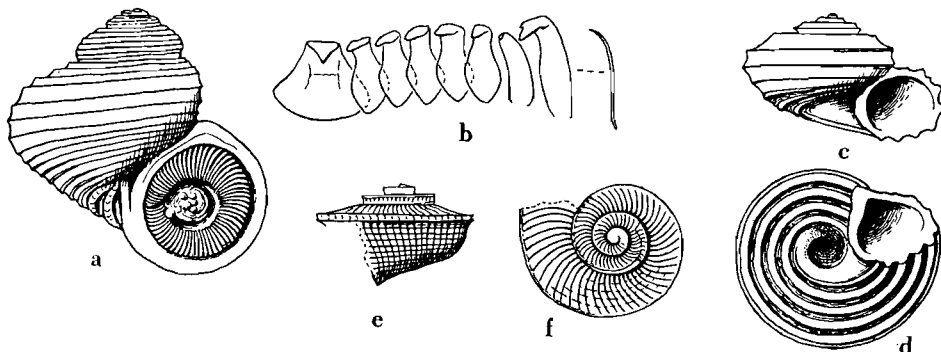


Fig. 2: *Calcar rhyssopoma* n.sp. a. shell with operculum. b. radula, central, lateral and marginal teeth, with one of the outermost marginals.
Minolia cycloma n.sp. c, d. lateral and basal views.
Scissurella tabulata n.sp. e, f. lateral and apical views.

with a denticle on outer and inner edge, following marginals decreasing, those in middle with serrulate cusps, outermost plates very slender.

Off Umkomaas (Natal) 40 fathoms, 4 living, 10 dead (Types); off Umhloti (Natal) 40 fathoms, one dead; off Cove Rock (East London) 22 fathoms, 5 dead (S.Afr.Mus., Nos. A9285 (Types), A9286, A9287, P.F.coll.).

Remarks.—The presence of 5 lateral plates in the radula seems to exclude this species from *Bothropoma*. The radula resembles somewhat that of *Calcar henicum* figured by Thiele (1903, p. 163, pl 8 (3), figs. 43, 43 a, b), especially as regards the 1st marginal plate.

H. & A. Adams (1854, pl. 44, fig. 3 a) figure the operculum of *Astrarium calcar*, which appears to have a wrinkled rim not unlike that of the present species.

Provisionally assigned to *Calcar*.

TROCHIDAE

Minolia cycloma n.sp.

Protoconch nucleus plus 4 whorls. Two spiral lirae beginning on 2nd whorl (fig. 2c), the upper one raised above level of suture, lower one in middle of whorl, a 3rd lira, peripheral, appears only on the last whorl; one intermediary between suture and 1st lira, and a stronger one between 1st and 2nd lirae towards end of last whorl; on base (fig. 2d) 5 lirae, with a fine one just within the widely open umbilicus. All lirae narrower than the grooves and sharp, but the basal ones not so sharp and almost as broad as the grooves. Growth-lines extremely fine, better seen on back of outer lip, and rather stronger within the umbilicus. Aperture circular. Alt. 2.75, diam. 4.5 mm.

Off Tugela River (Natal) 37 fathoms, one dead but fresh (S.Afr.Mus., No. A9279, P.F. coll.).

***Turcica salpinx* n.sp.**

Protoconch (fig. 3c) nucleus plus 6 whorls; profile nearly straight, sutures deeply indented, last whorl rounded at periphery. Protoconch smooth. First postnatal whorl with *c.* 30 fine retractive close-set axial pliculae on upper half of whorl; 2nd whorl also with *c.* 30 axial pliculae, extending across whorl and crossed by at first 3, later 4 nodulose lirae, on 5th whorl *c.* 36 nodules on the 4th (peripheral) lira. An axial plicula descends to each nodule, but is not always continued on to next row because in successive rows the nodules are more or less alternate; the sculpture is not truly cancellate when closely examined. Below the peripheral lira the whorls are strongly contracted to the suture, immediately above which is a 5th lira, weaker than the others. At end of last whorl the growth-lines tend to be bunched together and form pliculae.

Base rounded, with 5 nodulose lirae, the nodules closer together than on upper part of whorl, with axial pliculae. Aperture in juvenile and immature shell (fig. 3d) subcircular, expanded in adult, trumpet-like, peristome continuous, with free

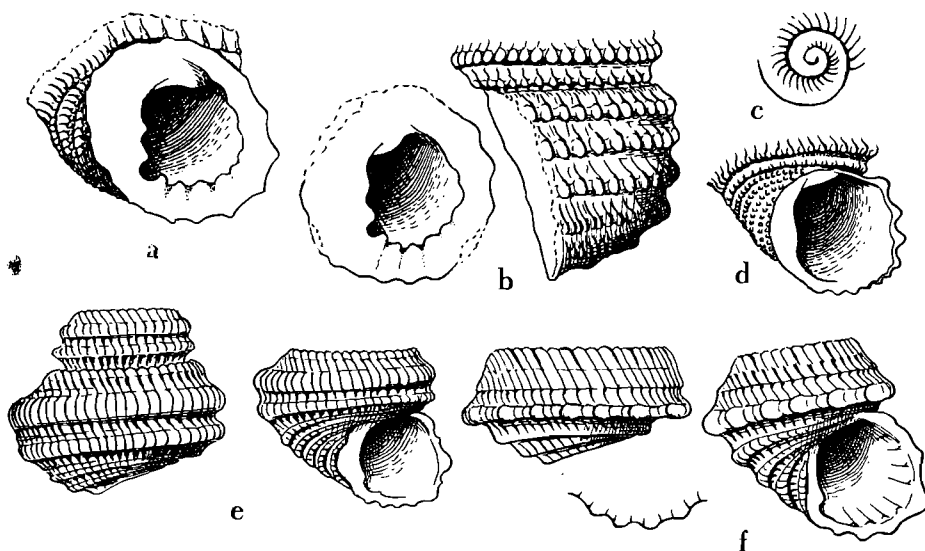


Fig. 3: *Turcica salpinx* n.sp. a. adult peristome (A9253). b. adult, peristome and side view (A9252). c. apical view of protoconch and 1st postnatal whorl. d. immature peristome (A9253). *Turcica helix* n.sp. e. back and side views. *Turcica konos* n.sp. f. back and front views, with portion of circumference in section.

edge (fig. 3 a, b). Columella in 3-whorled juvenile slightly concave, in 4-whorled and 5-whorled shells straight with a very slight convexity in middle; in adult with 2 blunt knobs. Umbilicus in 3-whorled juvenile open but narrow, in 4-whorled shell closed, in 5-whorled shell columellar glaze beginning to expand, in adult strongly

expanded, completely concealing site of umbilicus and the innermost spiral lira. Outer lip in adult with 8-9 blunt denticles within the margin.

Adult shell with 3rd-6th whorls, apex missing: alt. 11 mm., aperture approximately 6 x 6 mm. Three-whorled juvenile alt. and diam. 1.75 mm., 4-whorled shell alt. 4, diam. 3.5 mm., 5-whorled shell 7.5 x 6 mm.

Off Cape Morgan 77 fathoms, one adult, broken; off Hood Point (East London) 49 fathoms, 2 fresh juveniles, one immature, 3 fragments (S.Afr.Mus., Type material: Nos. A9252 and A9253, P.F. coll.).

Remarks.—Although no complete specimen is present, all the specific characters can be obtained from the juveniles, the broken adult, and the fragments. All these are regarded as Type material. The adult (fig. 3b) has lost the apex and the back half of the remaining whorls, and the edge of the peristome is damaged. One of the fragments is a complete peristome (fig. 3a).

In the 4-whorled shell there is a thin intermediary lira between the 1st and 2nd lirae on the 4th whorl.

The presence of two fresh unworn juveniles seems to indicate that the species is living in the East London area, and probably farther northwards.

***Turcica konos* n.sp.**

Protoconch nucleus plus 7 whorls; profile straight, whorls angulate at periphery above the deeply indented sutures (fig. 3f). Protoconch smooth. First postantal whorl (somewhat worn) with c. 14 axial retractive pliculae, c. 20 on 2nd whorl, increasing to c. 36 on 6th whorl, more numerous on last whorl because crowded together on back of outer lip, continued below peripheral carina to suture. On 2nd whorl one weak spiral lira forming the periphery; on 3rd and following whorls 2 spiral lirae, the lower one forming a strong peripheral carina, below which the whorl is contracted to the suture. Pliculae prominent at the suture, slightly nodulose. An intermediary spiral lira may develop between sutural nodules and upper lira on last whorl. Sculpture on early whorls clathrate, later punctate-foveolate.

On base 4 spiral lirae, crossed by axial pliculae, the innermost lira partly concealed by columellar callus in adult. Umbilicus in juvenile very small, in adult closed. Aperture sub-circular, with 7-8 pliculae within the margin in adult; columella in juvenile slightly convex in middle, in adult with a well-marked knob near lower end.

At every 2nd or 3rd plicula the peripheral carina is expanded into a nodule, thus in apical view the circumference is undulate; uppermost basal lira also slightly undulate. 6 x 4 mm. Buff, with a few brown spots on the basal lirae.

Off Umkomaas (Natal) 40 fathoms, 2 adult and one immature dead, one broken (Types); off Tugela River (Natal) 47 fathoms, one adult dead (S.Afr.Mus., Nos. A9257 (Types) and A9289, P.F. coll.).

***Turcica helix* n.sp.**

Protoconch nucleus plus 4 whorls; profile convex, sutures indented. First post-natal whorl with axial pliculae on later part, 2nd whorl with *c.* 18, increasing to *c.* 40-45 on last whorl, crowded together on back of outer lip. Two spiral lirae on 2nd-4th whorls, on last whorl an additional subsutural lira, and 2-3 intermediaries on later part of whorl. On base 4 spiral lirae, crossed by axial pliculae, a 5th lira partially obscured by columellar callus. Umbilicus closed. Aperture subcircular, with indications of pliculae within the margin; columella with small knob near lower end. 3 x 3 mm.; broken specimen diam. 3.5 mm. Fulvous, with broad dark brown radiating patches, one of which extends over periphery on to base in front of aperture. (fig. 3e).

Off Umkomaas (Natal) 40 fathoms, one broken; off Cape Vidal (Zululand) 80-100 fathoms, one dead but fresh (S.Afr.Mus., Nos. A9256, and (Type) A9295, P.F. coll.).

SCISSURELLIDAE

***Scissurella tabulata* n.sp.**

Protoconch nucleus plus $2\frac{1}{2}$ whorls. Profile angular at the slit, tabulate, convex below (fig. 2 e, f). On upper part *c.* 50 axial retractive pliculae, 4-5 very faint spiral lirae; on lower part axial pliculae and spiral lirae forming a clathrate sculpture. Slit beginning at end of last whorl. Diam. 2.3 mm.

Off Cape Natal (Durban) 440 fathoms, one living (S.Afr.Mus., No. A9345, P.F. coll.).

Remarks.—Very fragile. Differs from *agulhasensis* Thiele, 1925, in shape, fewer axial pliculae and almost complete absence of spiral lirae above the slit, and below the slit by a more open clathrate sculpture.

LEDIDAE

***Leda parceplicata* n.sp.**

Oval, more sharply rounded posteriorly than anteriorly; dorsal margin anteriorly straight, posteriorly slightly concave (fig. 4b). Early part of shell with concentric growth-lines only, later with fine pliculae on the middle part, usually slightly oblique and not quite conforming with the curve of the growth-lines; lateral parts smooth. Teeth at shell length 3 mm. 9-10 on both sides, at 5 mm. 10-11 anterior, 14-15 posterior, increasing to 12-13 and 16-17 respectively, with 2-3 minute ones on each side of the ligament pit. Pallial sinus present. Length 7.5, alt. 4.5 mm. When fresh: glossy amber-brown.

St. Francis Bay 24-30 fathoms, 4 valves; off Hood Point (East London) 49 fathoms, one living, 8 valves; off Cape Natal (Durban) 54 fathoms, one living, 17 valves; and 85 fathoms, 7 valves; off Umhloti River (Natal) 40 fathoms, a lot, living and odd valves (Types); off Umvoti River (Natal) 56 fathoms, one living,

5 valves; off Tugela River (Natal) 65-80 fathoms, 3 valves; off Durnford Point (Zululand) 90 fathoms, 3 valves (S.Afr.Mus. Nos. A9461-A9468, Types A9465, P.F. coll.).

Remarks.—These specimens, although only half the size, agree so well with *Yoldia semisculpta* Thiele, 1931, that they might well be assigned to the East African species. But according to Thiele's definition (1934) the valves of *Yoldia* gape posteriorly; the present specimens do not gape, and therefore I include them in *Leda* as a new species.

This species seems to be most abundant off the Natal coast in the neighbourhood of Durban (Umhloti). It occurred in the bottom-samples from all the localities where *spretia* Thiele, 1931, also was found, except off Cape Vidal.

***Sarepta natalensis* n.sp.**

Nearly symmetrically oval, but slightly flattened or very slightly indented on anterior margin, umbones subcentral (fig. 4a). Concentric growth-lines only. Teeth 12-13 anterior, 7-8 posterior, with 3-4 minute ones on each side of the small

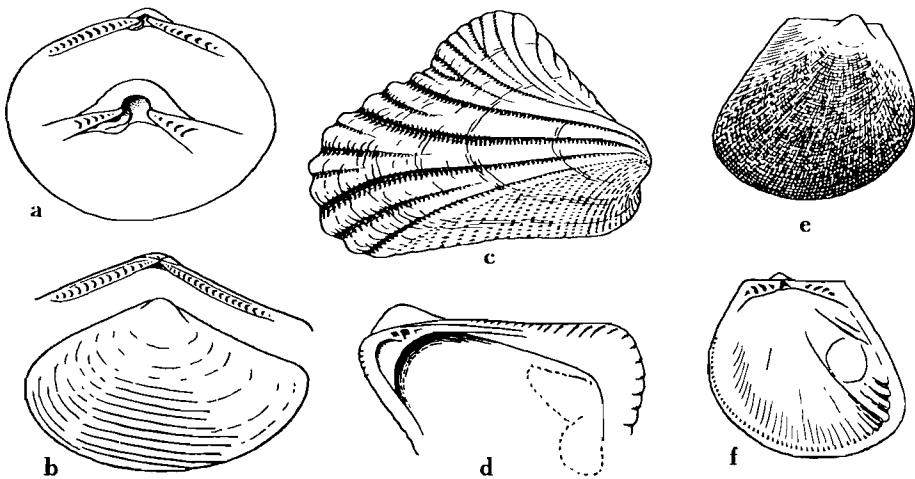


Fig. 4: *Sarepta natalensis* n.sp. a. internal view, with ligament pit further enlarged (only some of the teeth shown).
Leda parceplicata n.sp. b. external view, with internal view of hinge.
Septifer bisculpturata n.sp. c. external view of right valve, and d. internal view of dorsal portion.
Limopsis natalis n.sp. e, f. external and internal views.

deep ligament pit, which has a shelf extending anteriorly. Margin internally smooth. Periostracum thin, yellowish-grey. Length 4.5, alt. 3.5 mm. (Type); 5 x 4 mm. (paratype).

Off Cape Natal (Durban) 48 fathoms, one living (Type), and 85 fathoms, one living, one valve; off Tugela River (Natal) 65-80 fathoms, 7 valves (paratypes); off

Durnford Point (Zululand) 90 fathoms, one valve; off Cape Vidal (Zululand) 80-100 fathoms, one valve (S.Afr.Mus., Nos. A9474 (Type), A9469, A9470 (paratypes), A9471, and A9473, P.F. coll.).

Remarks.—Somewhat resembling *S.speciosa* A. Adams (see: Thiele, 1934, fig. 790) from the Pacific.

LIMOPSIDAE

Limposis natalis n.sp.

Length slightly greater than altitude, anterior margin convex, posterior margin nearly straight in upper two-thirds (fig. 4e). Umbo distinctly nearer to anterior end of hinge-line. Concentric and radial striae forming a fine cancellation, the intersections feebly granulose. Internally 4-5 low ridges posteriorly below the adductor scar, whole margin finely crenulate. Lower margin of hinge slightly concave; teeth interrupted in middle, 3 on each side, slightly oblique (fig. 4f). Length and alt. 4 mm.

Off Tugela River (Natal) 65-80 fathoms, 2 valves; off Cape Natal (Durban) 54 fathoms, one valve; off Umkomaas (Natal) 40 fathoms, 2 valves; off O'Neil Peak (Zululand) 55 fathoms, one living, 2 valves (Types) (S.Afr.Mus., Nos. A9478, A9479 (Types), A9480, A9481, P.F. coll.).

Remarks.—Quite different from the other South African species. A not dissimilar species is *antillensis* Dall, 1881, which however, is not definitely cancellate.

MYTILIDAE

Septifer bisculpturata n.sp.

Obliquely subtriangular, antero- and postero-dorsal corners rounded, anterior margin nearly straight, posterior margin slightly indented (fig 4c). Anterior to the umbonal ridge *c.* 30 riblets acutely diverging from the first umbonal rib; 4 main umbonal ribs radiating to the ventral margin and posterior margin below the indentation, once or twice bifid distally; posteriorly above the indentation about 7 or 8 riblets.

Except for 4 or 5 main growth-lines which cross the whole shell, numerous growth-lines which are scarcely indicated on the riblets, but well developed in the grooves as cross-bars connecting the riblets; the punctae thus produced are rounded squarish in the narrower grooves on the anterior and posterior sides, but transversely oblong in the broader grooves on the umbonal ridge.

Hinge with 2 square pits; septum not excised below the ligament. Dorsal margin of hinge-line with short oblique pliculae strongest between the end of ligament and postero-dorsal corner (fig. 4d). Margin slightly crenulate. Length (along hinge-line) 5, alt. 6.5 mm.; also 6 x 9 mm.

Off Tugela River (Natal) 40 fathoms, one valve (Type); off Umhloti River (Natal) 40 fathoms, one valve; off Cape Natal (Durban) 85 fathoms, one valve; off Umkomaas (Natal) 40 fathoms, one valve (S.Afr.Mus., Nos. A9482 (Type), A9483—A9485, P.F. coll.).

Remarks.—The coarsely sculptured dorsal area contrasted with the more finely sculptured ventral area is given as one of the features of *Hormomya* (Soot-Ryen, 1955, p. 37). *Hormomya*, however, has no septum.

UNGULINIDAE

Thyasira unilateralis n.sp.

Thin, translucent, subrhomboidal, inequilateral, 2 well marked grooves on the posterior part, and 2 very feeble radial ridges on middle part, causing a slight angularity on the ventral margin (fig. 5a). Concentric growth-lines. Length 7, alt. 7.5 mm.

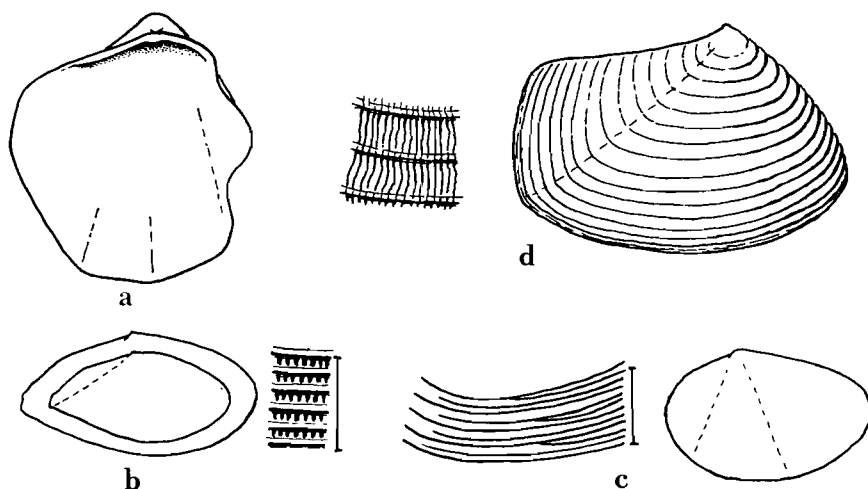


Fig. 5: *Thyasira unilateralis* n.sp. a. internal view.
Tellina acropisthus n.sp. b. outlines of two shells, dotted line indicates umbonal ridge; with external sculpture further enlarged.
Tellina europisthus n.sp. c. outline of shell, dotted lines indicate where reduction in the number of costulae occurs, with external sculpture further enlarged.
Myodora rectangularata n.sp. d. external view of right valve, with sculpture further enlarged.
(In b and c the line alongside sculpture=1 mm.)

Off O'Neil Peak (Zululand) 90 fathoms, 2 valves (Types); off Tongaat (Natal) 36 fathoms, one valve; off Cape Natal (Durban) 54 fathoms, one valve; off Hood Point (East London) 49 fathoms, one valve (S.Afr.Mus., Nos. A9520 (Types), A9521—A9523, P.F. coll.).

LUCINIDAE

Phacoides sepes n.sp.

Subcircular, equilateral, only a very slight posterior hollow, posterior margin slightly flattened. Numerous regular concentric costae, 7-8 in a space of 2 mm. at the margin in larger specimens, not lamellose, intervals with close-set radial pliculae, which may sometimes on the anterior and posterior parts form crenulations on the costae, or even a subcancellate appearance (fig. 6b). Lunule short, deep. One cardinal tooth and a dentiform lateral in each valve (fig. 6b). Ligament external. Inset part of anterior adductor scar moderately elongate. Margin internally smooth. Length 15, alt. 14, thickness (one valve) 3 mm.

Off Morewood Cove (Natal) 27 fathoms, 3 valves (Types); 33° 4' S. 27° 54' E. (off East London) 27 fathoms, 2 valves (S.Afr.Mus., Nos. A9529 (Types), A9530, P.F. coll.).

Phacoides sudes n.sp.

Oblong-oval, equilateral, antero-dorsal margin concave, postero-dorsal margin slightly convex, posterior margin slightly flattened. Concentric costae moderately widely spaced, 4-5 (6) in a space of 2 mm. but variable, sometimes additional costae interpolated, lamellose chiefly near the anterior and posterior dorsal margins which thus become more or less serrate; intervals with close-set radial pliculae. Lunule

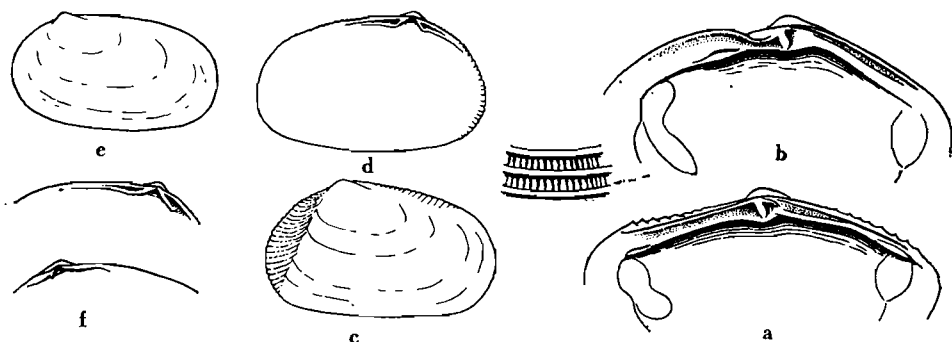


Fig. 6: *Phacoides sudes* n.sp. a. internal view of hinge. *Phacoides sepes* n.sp. b. internal view of hinge, with intercostal sculpture further enlarged. *Montacuta ornata* n.sp. c, d. external and internal views. *Montacuta siliqua* n.sp. e. external view. f. internal view of hinge of right valve (above) and left valve (below).

long, narrow. One cardinal tooth and an anterior and a posterior lateral in each valve, the laterals often obscure (? worn) (fig. 6a). Ligament external. Inset part of anterior adductor scar short and broad. Margin internally smooth. Length 10.75, alt. 9.25, thickness (one valve) 1.5 mm.

Off Cape Natal (Durban) 54 fathoms, 8 valves (Types); off Umhloti River (Natal) 40 fathoms, 13 valves; off Hood Point (East London) 49 fathoms, one living, one valve (S.Afr.Mus., Nos. A9531 (Types), A9532, A9533, P.F. coll.).

Remarks.—Shape, lunule, and more widely spaced and lamellose concentric costae distinguish this species from *sepes*.

MONTACUTIDAE

Montacuta ornata n.sp.

Thin, oblong-oval, inequilateral, ante-umbonal length twice the post-umbonal length, anterior and posterior margins broadly rounded, ventral margin straight or very slightly curved; posteriorly a slight and obscure ridge or angle from umbo, from which *c.* 24 oblique riblets run to the posterior margin; similar shorter riblets at the antero-dorsal margin (fig. 6c). Internally antero-dorsal and posterior margins serrulate; 2 divergent lamellar teeth; ligament internal (seemingly); muscle scars and pallial line obscure (fig 6d). White, semipellucid. Length 6, alt. 3·5 mm.

Off Umhloti River (Natal) 40 fathoms, 4 (right) valves (S.Afr.Mus., No. A9538, P.F. coll.).

Remarks.—The umbones are assumed to be behind the middle (by analogy with *M.cylindracea*, see: Smith, 1885, p. 206). The species can presumably be included in *Montacuta*.

Montacuta siliqua n.sp.

Thin, oblong-oval, inequilateral, umbones behind middle, anterior and posterior margins broadly rounded, ventral margin almost straight; surface with growth-lines only (fig. 6c). In right valve 2 divergent lamellar teeth, in left valve hinge margin lamellate, a small denticle on the posterior margin of internal ligament pit (fig. 6f). White, semipellucid. Length 9, alt. 4·75 mm.

Off Umhloti River (Natal) 40 fathoms, 2 left, 2 right valves (S.Afr.Mus., No. A9539, P.F. coll.).

Remarks.—As in the previous species the umbones are presumed to be posterior to the middle.

TELLINIDAE

Tellina acropisthus n.sp.

Oval, equilateral (very nearly), antero-dorsal margin slightly convex, postero-dorsal margin more sloping, slightly angularly convex in middle, hind end acuminate but subtruncate; umbonal ridge very obtuse; fine concentric costulae, close-set anteriorly, some of them petering out at about the umbonal ridge, so that on posterior

part the costulae are fewer and farther apart; in middle of the valve about 6 costulae in a space of 1 mm.; in the grooves between the costulae fine radial pliculae over whole valve, more clearly seen on middle and posterior parts than on the anterior part where the costulae are very close together (fig. 5b). Right valve with 2 cardinal teeth, the posterior one bifid, anterior and posterior lateral teeth about equidistant from the cardinals. [Left valve not present.] Pallial sinus extending to about vertical from anterior lateral tooth, curving backwards to pallial line a little behind vertical from umbo. No internal rib. Length 15, alt. 8 mm., also 11.5 x 6.5 mm.

Off Cape Natal (Durban) 48 fathoms, 2 right valves (Types); off Cape Vidal (Zululand) 80-100 fathoms, one valve (S.Afr.Mus., Nos. A9547 (Types), A9548, P.F. coll.).

Remarks.—Closely resembling the North Australian *murrayi* Smith, 1885 (p. 98, pl. 3, figs. 8-8b), which is characterised by the petering out of some of the costulae posteriorly. But the costulae are less numerous and less closely crowded than in the present specimens; even at 8 mm. long (the size of Smith's specimen) the costulae outnumber those shown in Smith's figure.

The East Indies *patagiata* Prashad, 1932 (p. 182, pl. 5, figs. 34, 35) is not so similar, being deeper proportionately to the length, and having fewer costulae, all of which are continuous across the shell.

Tellina europisthus n.sp.

Oval, inequilateral, antero-dorsal margin nearly straight, anterior margin rounded, postero-dorsal margin shorter, steeply sloping to the broadly rounded posterior margin; umbonal ridge obsolete; fine close-set concentric costulae anteriorly, decreasing in number posteriorly, firstly by anastomosis at a line from umbo to about the middle of lower margin, and again by petering out farther posteriorly (about where the umbonal ridge would be if present); about a dozen costulae in a space of 1 mm. anterior to the anastomosis, 7-8 after it, and 4-5 on posterior part (fig. 5c). Right valve with 2 cardinal teeth, the posterior one bifid, anterior lateral tooth farther from cardinals than the posterior lateral, left valve with 2 cardinals, the anterior one bifid, posterior one feeble, no lateral. Pallial sinus not quite extending to anterior adductor scar, joining pallial line at vertical from umbo. No internal rib. Cream coloured. Length 9.5, alt. 6.5 mm.

Off Cape Natal (Durban) 54 fathoms, 3 right, 3 left valves (Types); off Morewood cove (Natal) 27 fathoms, 3 left valves; off Tugela River (Natal) 37 fathoms, 2 right valves (S.Afr.Mus., Nos. A9549 (Types), A9550, A9551, P.F. coll.).

Delagoa Bay, 2 living (S.Afr.Mus., coll. K.H.B. No. A9552).

Remarks.—As in *murrayi* and *acropisthus* there is a reduction in the number of costulae towards the posterior end, but in the present specimens there is a double reduction. The position of the anastomosis and petering out is slightly variable.

MYOCHAMIDAE

***Myodora rectangularata* n.sp.**

Inequivalve, right valve slightly convex, left valve smaller, nearly flat; inequilateral, umbo prominent, a little nearer the anterior end; antero-dorsal margin nearly straight, postero-dorsal margin concave, hind end truncate. A slight ridge from umbo to postero-ventral corner in right valve, less distinct in left valve. Concentric lirae at more or less regular intervals on right valve, less well developed and often not distinct from the growth-lines on left valve; minute close-set radial striae often more distinct on left valve, and usually more distinct on the anterior half (fig. 5d). Right valve hinge with an anterior and posterior lateral ridge fitting under the edge of the left valve. Interior strongly nacreous. Pallial sinus wide but shallow. Length (right valve) 13, alt. 9 mm.

Off O'Neil Peak (Zululand) 90 fathoms, 6 living, 15 valves (Types); off Tongaat (Natal) 36 fathoms, 11 living; off Hood Point (East London) 49 fathoms, 4 valves (S.Afr.Mus., Nos. A9556 (Types), A9557, A9558, P.F. coll.).

Remarks.—More oblong than *quadrata* Smith, 1899, from the Indian Ocean (Smith) and East coast of Africa (Jaekel, 1931), and *valdiviae* Jaekel, 1931, from the East Indies. More oblong also than *brevis* Sow., 1829, and with longer truncate hind end and less curved ventral margin.

Smith did not mention any sculpture on *quadrata* except the concentric lirae; Jaekel said *valdiviae* had a very fine reticulation ("Netzskulptur"). In the present specimens the micro-sculpture is definitely radially striate.

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ADDENDA

The following paratypes of the above-described species have been deposited in the Natal Museum:

Mangilia serrula (1, S.Afr.Mus.Reg.no. A8728), *Columbella dibolos* (1, S.A.M.R.no. A9636), *Calcar? rhyssopoma* (3, S.A.M.R.no. A9285), *Leda parceplicata* (3+3 valves, S.A.M.R.no. A9465), *Sarepta natalensis* (2 valves, S.A.M.R.no. A9470), *Limopsis natalis* (1 valve, S.A.M.R.no. A9481), *Thyasira unilaterialis* (1 valve, S.A.M.R.no. A9523), *Phacoides sepes* (1, S.A.M.R.no. A9529), *P. sudes* (2 valves, S.A.M.R.no. A9531), *Montacuta ornata* (1 valve, S.A.M.R.no. A9538), *M. siliqua* (1 valve, S.A.M.R.no. A9539), *Tellina acropisthus* (1 valve, S.A.M.R.no. A9547), *T. europisthus* (2 valves, S.A.M.R.no. A9549), *Myodora rectangulata* (4, S.A.M.R.no. A9556).

Date received: 10 July, 1962.